BUILDING UP COMPONENTS

USIN stock sections, off-cuts, and pieces of material which may be too small for other purposes, it is often possible to build up parts cheaply-or to machine them from the solid-and so save time and effort, or avoid some tricky operation. Technically, too, there may be advantages m fabrication-though, conversely, the parts might have been equally as efficient as castings. Still, if there is nothing in it either way, then cost, effort or skill may be the deciding factor.

Building up parts may also stimulate the imagination to break down complicated components into elementary solids like cylinders and

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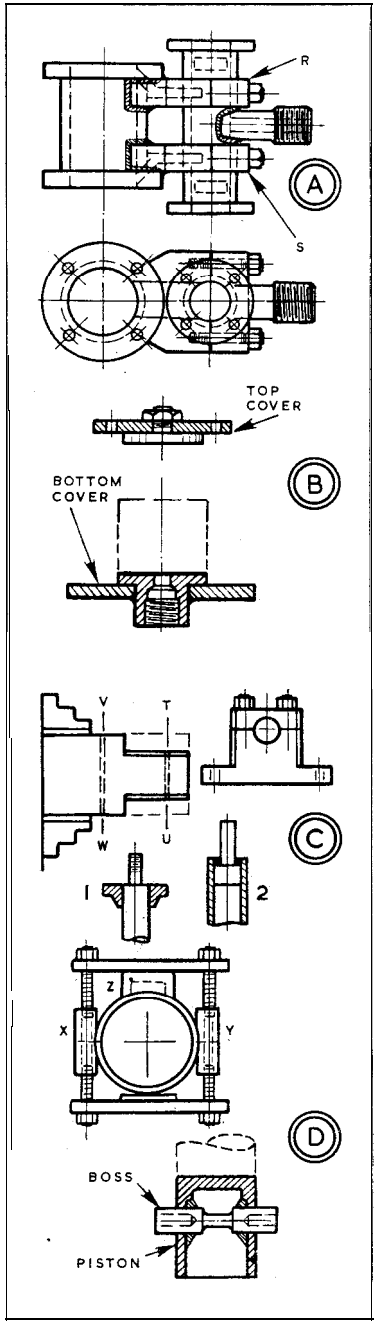
cubes, and one may go on to recognise such features as bosses, flanges, ribs and lugs, as smaller versions applied to the main structure. Possibilities can then be discovered in oddments of material, and a use can be found for them if one has nothing definite in mind but is merely seeking " something to make." Many attractive models have begun in this way.

In particular, stationary steam engines, in small and medium sizes, offer many possibilities for using stock material. There are various ways of building up that most important component, the cylinder. The actual cylinder, the part in which the piston moves, as distinct from the whole component with the valve face, can be machined from a piece of solid or cored round stock, facing, boring, and turning on the outside to leave flanges. For the valve face, a rectangular block can be radiused to fit the outside of the cvlinder. using a fly-cutter, or "boring " on an angle plate; and after drilling or milling the ports, the block and the cylinder can be tinned on their abutting faces and sweated together.

Adaptmg this principle, a piston valve cylinder can be built up, A. Instead of the one block as for the slide-valve cylinder, there are two blocks, ***R*** and S, silver-soldered or brazed to the steam cylinder, while



the piston valve cylinder is mounted in them by clamps. With this construction, the blocks can be prepared. They can be bored and radiused, the ports can be cut in them by drilling and filing or milling, and matching ports can likewise be made at the ends of the cylinder.

For silver-soldering or brazing, the blocks can be clamped on a rod and stood on the cylinder. Afterwards, they can be cleaned by reaming or lapping where they grip the valve cylinder: and the corresponding areas on this 'cylinder can be turned true after steam and exhaust bosses have been attached. Fabrication is thus strong and precise, and the work on the ports straightforward.

Covers for cylinders

Cylinder covers are components that can be built up, the spigot of the top one being attached by a nut, B. Sometimes the bottom cover mounts the cylinder on pillars, which means that it must be cut from plate material, with the piece incorporating the spigot and gland boss sweated to it. To get alirmment. the cover is drilled or gored, and the gland boss and spigot are turned, but left on the rod. After tinning, the pieces are sweated. Then the rod is rechucked to finish the cover and spigot and drill and tap for the gland.

Time in turning pillars with flanges can be saved by pressing on a shaped collar each end, Cl. Tubular pillars can be built up by brazing in a stepped plug, 2, turning to size, facing to length and threading. Pedestal bearings can be machined from rectangular stock in the independent chuck. A saw cut, ***T-U,*** removes the cap, and after refacing a second cut, V-W, removes the pedestal. Both are faced on the underside in the chuck.

Other components that can be built up to advantage are small cast iron pistons and port bands for two-stroke engines, ***D.*** The piston is bored from rod, and the bosses-joined by a neck-are drilled each end and brazed in. Continuing the drilling breaks out the neck. The port band is from tubing, with bosses XY and transfer way Z brazed at the set-up shown. The bosses are overlength for screws and are faced down afterwards. El